INDEX TO VOLUME XXVI

October, 1903, to March, 1904.

LEADING ARTICLES.

Abbot, Gen. Henry L. The Solution of the Isthmian-Canal Problem 481

Alcohol Motor—Mechanical and Commercial Aspects of the (Illustrated) *Henri Dupays* 682

Allen, Chas. V. Diamond Mining in the Kimberley Field (Illustrated) 81, 177

Aluminothermics—Mechanical and Metallurgic Applications of (Illustrated) *Emile Guarini* 561

Apartment Houses—The Power Plant and Mechanical Equipment of *Percival Robert Moses* 713

Apprenticeship System—An Example of the Modern Development of the *L. D. Burlingame* 511

Apprentices in an Engineering Works—The Training of (Illustrated) *C. E. Downton* 380

Apprentice. *See also* Mechanic.

Ball, W. Valentine The Penalty Clause in Engineering Contracts 674

Baxter, George H. Hydraulic Power Appliances in the Engineering Industries (Illustrated) 878

Bell, Louis The Relation of Electric Inventions to Human Activity (Illustrated) 967

Boilers and Fireboxes—Special Features in the Design of Locomotive (Illustrated) *Chas. S. Lake* 62, 216, 390

Bolton, Reginald P. Mechanical Auxiliaries to the Economy of the Fireroom (Illustrated) 950

Boundary District of British Columbia—Ore Quarrying in the (Illustrated) *E. Jacobs* 236

British Columbia—Ore Quarrying in the Boundary District of (Illustrated) *E. Jacobs* 236

British Columbia—The Water Powers of (Illustrated) *E. Jacobs* 333

British Railways—Locomotives for Special Service on (Illustrated) *J. F. Gairns* 700
Burlingame, L. D. An Example of the Modern Development of the Apprenticeship System 511
Canal Organization and Personnel in the Building of the Panama *Fullerton L. Waldo* 488
Canal Problem—The Solution of the Isthmian *Gen. Henry L. Abbot* 481
Canal—The Republic of Columbia and the Panama (Illustrated) *John Geo. Leigh* 1
Capital, Costs, Profits and Dividends—Manufacturing: (Illustrated) *Henry Hess* 367
Capital—The Issues Between Labor and *Egbert P. Watson* . 75
China—Railway Making in (Illustrated) *Thomas H. Reid* . 321
Coal-Mining Industry of the United Kingdom (Illustrated) *R. A. S. Redmayne* 20, 193, 400
Collins, G. Fred Mining and Railway Development in Peru (Illustrated) 641
Colombia and the Panama Canal—The Republic of (Illustrated) *John Geo. Leigh* 1
Combustion Motor—Lines of Progress in the Efficiency of the (Illustrated) *Edward C. Warren* 664
Contracts—The Penalty Clause in Engineering *W. Valentine Ball* 674
Costs, Profits and Dividends—Manufacturing: Capital (Illustrated) *Henry Hess* 367
Cutting Speeds and Feeds with the New Tool Steels *Oberlin Smith* 569
Deep Mining—The Limits and Possibilities of (Illustrated) *E. H. Roberton* 546
Development of Power-Driven Machinery in the Mine (Illustrated) *E. H. Roberton* 925
Developments of the Steam Turbine—Recent (Illustrated) *A. Rateau.* 49
Diamond Mines—The Mechanical Equipment of the Kimberley (Illustrated) *Chas. V. Allen* 177
Diamond Mining in the Kimberley Field (Illustrated) *Chas. V. Allen* 81
Diemer, Hugo The Fixing of Piece-Work Rates (Illustrated) . 169
Dividends—Manufacturing: Capital, Costs, Profits and (Illustrated) *Henry Hess* 367
Downton, C. E. The Training of Apprentices in an Engineering Works (Illustrated) 380
Duncan, Louis Technical Education—What It Should Be . 161

Dupays, Henri MECHANICAL AND COMMERCIAL ASPECTS OF THE ALCOHOL MOTOR (Illustrated) 682
EDUCATION, WHAT IT SHOULD BE—TECHNICAL *Louis Duncan. With Editorial Commentary* 161
ELECTRIC INVENTIONS TO HUMAN ACTIVITY—THE RELATION OF (Illustrated) *Louis Bell* 967
ELECTRIC-RAILWAY TRIALS—THE MARIENFELDE-ZOSSEN HIGH-SPEED (Illustrated) *Alfred Gradenwitz* 494
ELECTRIC TROLLEY VEHICLES WITHOUT RAILS (Illustrated) *Emile Guarini* 33
ENGINEERING SOCIETIES—THE HOMES OF THE GREAT (Illustrated) *Henry Harrison Suplee* 520
ETHICS OF WORKSHOP MANAGEMENT *Egbert P. Watson* . . 250
EXAMPLE OF THE MODERN DEVELOPMENT OF THE APPRENTICESHIP SYSTEM *L. D. Burlingame* 511
FEEDS WITH THE NEW TOOL STEELS—CUTTING SPEEDS AND *Oberlin Smith* 569
FIREBOXES—SPECIAL FEATURES IN THE DESIGN OF LOCOMOTIVE BOILERS AND (Illustrated) *Chas. S. Lake* . . . 62, 216, 390
FIREROOM—MECHANICAL AUXILIARIES TO THE ECONOMY OF THE (Illustrated) *Reginald P. Bolton* 950
FIXING OF PIECE-WORK RATES (Illustrated) *Hugo Diemer* . . 169
Flynt, H. Spencer SOME SOURCES OF ERROR IN WATER TREATMENT 231
FOUNDRY OPERATIONS—LABOR-SAVING MACHINERY IN (Illustrated) *Richard Moldenke* 896
Gairns, J. F. LOCOMOTIVES FOR SPECIAL SERVICE ON BRITISH RAILWAYS (Illustrated) 700
GAS ENGINE. *See* COMBUSTION MOTOR
GAS—RECENT DEVELOPMENTS IN THE PRODUCTION OF WATER (Illustrated) *A. Humboldt Sexton* 205
Gradenwitz, Alfred THE MARIENFELDE-ZOSSEN HIGH-SPEED ELECTRIC RAILWAY TRIALS (Illustrated) 494
GREECE—THE FIRST HYDRO-ELECTRIC STATION OF (Illustrated) *Emile Guarini* 694
Guarini, Emile ELECTRIC TROLLEY VEHICLES WITHOUT RAILS (Illustrated) 33
Guarini, Emile MECHANICAL AND METALLURGIC APPLICATIONS OF ALUMINOTHERMICS (Illustrated) 561
Guarini, Emile THE FIRST HYDRO-ELECTRIC STATION OF GREECE (Illustrated) 694
Hess, Henry MANUFACTURING: CAPITAL, COSTS, PROFITS AND DIVIDENDS (Illustrated) 367
HIGH-SPEED ELECTRIC-RAILWAY TRIALS—THE MARIENFELDE-ZOSSEN (Illustrated) *Alfred Gradenwitz* 494

HOMES OF THE GREAT ENGINEERING SOCIETIES (Illustrated) *Henry Harrison Suplee* 520
Hunt, Robert W. THE WORLD'S GREAT LABOR SAVERS AND LABOR SERVERS (Illustrated) 803
HYDRAULIC POWER APPLIANCES IN THE ENGINEERING INDUSTRIES (Illustrated) *George H. Baxter* 878
HYDRO-ELECTRIC STATION OF GREECE—THE FIRST (Illustrated) *Emile Guarini* 694
INVENTORS. *See* LABOR SAVERS.
ISOLATED PLANTS—THE SYSTEMATIZED OPERATION OF (Illustrated) *Percival Robert Moses* 410
ISSUES BETWEEN LABOR AND CAPITAL *Egbert P. Watson* . . 75
ISTHMIAN-CANAL PROBLEM—THE SOLUTION OF THE *Gen. Henry L. Abbot* 481
ISTHMIAN CANAL. *See also* PANAMA CANAL.
Jacobs, E. ORE QUARRYING IN THE BOUNDARY DISTRICT OF BRITISH COLUMBIA (Illustrated) 236
Jacobs, E. THE WATER POWERS OF BRITISH COLUMBIA (Illustrated) 333
KIMBERLEY DIAMOND MINES—THE MECHANICAL EQUIPMENT OF THE (Illustrated) *Chas. V. Allen* 177
KIMBERLEY FIELD—DIAMOND MINING IN THE (Illustrated) *Chas. V. Allen* 81
LABOR AND CAPITAL—THE ISSUES BETWEEN *Egbert P. Watson* . 75
LABOR SAVERS AND LABOR SERVERS—THE WORLD'S GREAT (Illustrated) *Robert W. Hunt* 803
LABOR-SAVING MACHINERY IN FOUNDRY OPERATIONS (Illustrated) *Richard Moldenke* 896
LABOR'S RISE THROUGH LABOR-SAVING MACHINERY *F. H. Rose* . 836
Lake, Chas. S. SPECIAL FEATURES IN THE DESIGN OF LOCOMOTIVE BOILERS AND FIREBOXES (Illustrated) . . . 62, 216, 390
Leigh, John Geo. THE REPUBLIC OF COLOMBIA AND THE PANAMA CANAL (Illustrated) 1
Letheule, Paul THE METROPOLITAN RAILWAY OF PARIS (Illustrated) 349
LIMITS AND POSSIBILITIES OF DEEP MINING (Illustrated) *E. H. Roberton* 546
LINES OF PROGRESS IN THE EFFICIENCY OF THE COMBUSTION MOTOR (Illustrated) *Edward C. Warren* 664
LOCOMOTIVE BOILERS AND FIREBOXES—SPECIAL FEATURES IN THE DESIGN OF (Illustrated) *Chas. S. Lake* 62, 216, 390
LOCOMOTIVES FOR SPECIAL SERVICE ON BRITISH RAILWAYS (Illustrated) *J. F. Gairns* 700
MACHINERY IN THE MINE—THE DEVELOPMENT OF POWER-DRIVEN (Illustrated) *E. H. Roberton* 925

MANUFACTURING: CAPITAL, COSTS, PROFITS AND DIVIDENDS (Illustrated) *Henry Hess* 367
MARIENFELDE-ZOSSEN HIGH-SPEED ELECTRIC-RAILWAY TRIALS (Illustrated) *Alfred Gradenwitz* 494
MECHANICAL AND COMMERCIAL ASPECTS OF THE ALCOHOL MOTOR (Illustrated) *Henri Dupays* 682
MECHANICAL AND METALLURGICAL APPLICATIONS OF ALUMINOTHERMICS (Illustrated) *Emile Guarini* 561
MECHANICAL AUXILIARIES TO THE ECONOMY OF THE FIREROOM (Illustrated) *Reginald P. Bolton* 950
MECHANICAL EQUIPMENT OF APARTMENT HOUSES—THE POWER PLANT AND *Percival Robert Moses* 713
MECHANICAL EQUIPMENT OF THE KIMBERLEY DIAMOND MINES (Illustrated) *Chas. V. Allen* 177
MECHANIC OF THE FUTURE AND HIS TRAINING *Egbert P. Watson* . 726
METALLURGIC APPLICATIONS OF ALUMINOTHERMICS—MECHANICAL AND (Illustrated) *Emile Guarini* 561
METROPOLITAN RAILWAY OF PARIS (Illustrated) *Paul Letheule* . . 349
MINE—THE DEVELOPMENT OF POWER MACHINERY IN THE (Illustrated) *E. H. Roberton* 925
MINING AND RAILWAY DEVELOPMENT IN PERU (Illustrated) *G. Fred Collins* 641
MINING—THE LIMITS AND POSSIBILITIES OF DEEP (Illustrated) *E. H. Roberton* 546
MODERN DEVELOPMENT OF THE APPRENTICESHIP SYSTEM—AN EXAMPLE OF THE *L. D. Burlingame* 511
Moldenke, Richard LABOR-SAVING MACHINERY IN FOUNDRY OPERATIONS (Illustrated) 896
Moses, Percival Robert THE POWER PLANT AND MECHANICAL EQUIPMENT OF APARTMENT HOUSES 713
Moses, Percival Robert THE SYSTEMATIZED OPERATION OF ISOLATED PLANTS (Illustrated) 410
MOTOR—LINES OF PROGRESS IN THE EFFICIENCY OF THE COMBUSTION (Illustrated) *Edward C. Warren* 664
ORE QUARRYING IN THE BOUNDARY DISTRICT OF BRITISH COLUMBIA (Illustrated) *E. Jacobs* 236
ORGANIZATION AND PERSONNEL IN THE BUILDING OF THE PANAMA CANAL *Fullerton L. Waldo* 488
PANAMA CANAL—ORGANIZATION AND PERSONNEL IN THE BUILDING OF THE *Fullerton L. Waldo* 488
PANAMA CANAL—THE REPUBLIC OF COLOMBIA AND THE (Illustrated) *John Geo. Leigh* 1
PANAMA CANAL. *See also* ISTHMIAN CANAL.
PARIS—THE METROPOLITAN RAILWAY OF (Illustrated) *Paul Letheule* 349
PENALTY CLAUSE IN ENGINEERING CONTRACTS *W. Valentine Ball* . 674

PERSONNEL IN THE BUILDING OF THE PANAMA CANAL—ORGANIZATION AND *Fullerton L. Waldo* 488
PERU—MINING AND RAILWAY DEVELOPMENT IN (Illustrated) *G. Fred Collins* 641
PIECE-WORK RATES—THE FIXING OF (Illustrated) *Hugo Diemer* . 169
POWER PLANT AND MECHANICAL EQUIPMENT OF APARTMENT HOUSES *Percival Robert Moses* 713
PRIME MOVER AND ITS INFLUENCE ON THE WORLD'S PROGRESS (Illustrated) *John E. Sweet* 846
PROFITS AND DIVIDENDS—MANUFACTURING: CAPITAL, COSTS (Illustrated) *Henry Hess* 367
QUARRYING IN THE BOUNDARY DISTRICT OF BRITISH COLUMBIA—ORE (Illustrated) *E. Jacobs* 236
RAILWAY DEVELOPMENT IN PERU—MINING AND (Illustrated) *G. Fred Collins* 641
RAILWAY OF PARIS—THE METROPOLITAN (Illustrated) *Paul Letheule* 349
RAILWAY MAKING IN CHINA (Illustrated) *Thomas H. Reid* . . 321
RAILWAYS—LOCOMOTIVES FOR SPECIAL SERVICE ON BRITISH (Illustrated) *J. F. Gairns* 700
RAILWAY WORKER—WHAT THE INVENTOR HAS DONE FOR THE *Arthur M. Waitt* 872
Rateau, A. RECENT DEVELOPMENTS OF THE STEAM TURBINE (Illustrated) 49
RECENT DEVELOPMENTS IN THE PRODUCTION OF WATER GAS (Illustrated) *A. Humboldt Sexton* 205
RECENT DEVELOPMENTS OF THE STEAM TURBINE (Illustrated) *A. Rateau* 49
Redmayne, R. A. S. THE COAL-MINING INDUSTRY OF THE UNITED KINGDOM (Illustrated) 20, 193, 400
Reid, Thomas H. RAILWAY MAKING IN CHINA (Illustrated) . . 321
RELATION OF ELECTRIC INVENTIONS TO HUMAN ACTIVITY (Illustrated) *Louis Bell* 967
REPUBLIC OF COLOMBIA AND THE PANAMA CANAL (Illustrated) *John Geo. Leigh* 1
RISE OF LABOR THROUGH LABOR-SAVING MACHINERY *F. H. Rose* 836
Roberton, E. H. THE DEVELOPMENT OF POWER-DRIVEN MACHINERY IN THE MINE (Illustrated) 925
Roberton, E. H. THE LIMITS AND POSSIBILITIES OF DEEP MINING (Illustrated) 546
Rose, F. H. THE RISE OF LABOR THROUGH LABOR-SAVING MACHINERY 836
Sexton, A. Humboldt. RECENT DEVELOPMENTS IN THE PRODUCTION OF WATER GAS (Illustrated) 205
Smith, Oberlin. CUTTING SPEEDS AND FEEDS WITH THE NEW TOOL STEELS 569

SOLUTION OF THE ISTHMIAN-CANAL PROBLEM *Gen. Henry L. Abbot* 481
SOME SOURCES OF ERROR IN WATER TREATMENT *H. Spencer Flynt* 231
SPECIAL FEATURES IN THE DESIGN OF LOCOMOTIVE BOILERS AND FIRE-BOXES (Illustrated) *Chas. S. Lake* . . . 62, 216, 390
STEAM ENGINE. *See* PRIME MOVER.
STEAM TURBINE—RECENT DEVELOPMENTS OF THE (Illustrated) *A. Rateau* 49
STEELS—CUTTING SPEED AND FEEDS WITH THE NEW TOOL *Oberlin Smith* 569
STOKING. *See* FIREROOM.
Suplee, Henry Harrison. THE HOMES OF THE GREAT ENGINEERING SOCIETIES (Illustrated) 520
Sweet, John E. THE PRIME MOVER AND ITS INFLUENCE ON THE WORLD'S PROGRESS (Illustrated) 846
SYSTEMATIZED OPERATION OF ISOLATED PLANTS (Illustrated) *Percival Robert Moses* 410
TECHNICAL EDUCATION—WHAT IT SHOULD BE *Louis Duncan. With Editorial Commentary* 161
TOOL STEELS—CUTTING SPEEDS AND FEEDS WITH THE NEW *Oberlin Smith* 569
TRAINING OF APPRENTICES IN AN ENGINEERING WORKS (Illustrated) *C. E. Downton* 380
TRAINING—THE MECHANIC OF THE FUTURE AND HIS *Egbert P. Watson* 726
TROLLEY VEHICLES WITHOUT RAILS—ELECTRIC (Illustrated) *Emile Guarini* 33
UNITED KINGDOM—THE COAL-MINING INDUSTRY OF THE (Illustrated) *R. A. S. Redmayne* 20, 193, 400
VEHICLES WITHOUT RAILS—ELECTRIC TROLLEY (Illustrated) *Emile Guarini* 33
Waitt, Arthur M. WHAT THE INVENTOR HAS DONE FOR THE RAILWAY WORKER 872
Waldo, Fullerton L. ORGANIZATION AND PERSONNEL IN THE BUILDING OF THE PANAMA CANAL 488
Warren, Edward C. LINES OF PROGRESS IN THE EFFICIENCY OF THE COMBUSTION MOTOR (Illustrated) 664
WATER GAS—RECENT DEVELOPMENTS IN THE PRODUCTION OF (Illustrated) *A. Humboldt Sexton* 205
WATER POWERS OF BRITISH COLUMBIA (Illustrated) *E. Jacobs* . 333
WATER POWER. *See also* PRIME MOVER.
WATER TREATMENT—SOME SOURCES OF ERROR IN *H. Spencer Flynt* 231
Watson, Egbert P. ETHICS OF WORKSHOP MANAGEMENT . . 250
Watson, Egbert P. THE ISSUES BETWEEN LABOR AND CAPITAL . 75
Watson, Egbert P. THE MECHANIC OF THE FUTURE AND HIS TRAINING 726

WHAT THE INVENTOR HAS DONE FOR THE RAILWAY WORKER *Arthur M. Waitt* 872
WORKSHOP MANAGEMENT—ETHICS OF *Egbert P. Watson* . . 250
WORLD'S GREAT LABOR SAVERS AND LABOR SERVERS (Illustrated) *Robert W. Hunt* 803
ZOSSEN HIGH-SPEED ELECTRIC-RAILWAY TRIALS—THE MARIENFELDE (Illustrated) *Alfred Gradenwitz* 494

REVIEWS, INDEX, AND EDITORIALS.

Accumulator. *See* Storage Battery.
Acetylene—Portable Applications of.. 116
Action of Sea Water on Alloys 270
Air Resistance—Experiments on 107
Alloys—The Action of Sea Water on. 270
Alloys—The Theory of Nickel-Steel.. 102
American Industry—A German View of 264
Applications of Acetylene—Portable.. 116
Apprentices—The Instruction of.... 438
Boiler Feed Water—The Preparation of 748
Boilers—Modern Naval 752
Books Announced 160
Books Received 160, 320, 640, 800
Book Reviews.....159, 317, 639, 798, 1039
Bridge at New York—The New Suspension 760
Canal—The Growth of the Suez.... 441
Carbon Vapor—A Study of..... 597
Central Stations—Gas Power for 741
Centrifugal Pumps—Flow in..... 435
Chemistry—Engineering and 120
Civil Engineering, Engineering Index 123, 283, 447, 603, 761, 1005
Coking Processes—Modern 432
Commerce and Engineering..... 737
Copper Refining—Electrolytic 279
Copper—The Electrical Smelting of.. 282
Current Record of New Books....159, 317, 639, 798, 1039
Deformation of Materials 590
Determination of Wages 579
Development of Shipbuilding in Great Britain 581
Economics—Workshop 583
Economy of Fuel in Power Stations.. 111
Edison Storage Battery..... 585
Editorial Comment ..99, 255, 420, 575, 735, 979
Education—Influence of Engineering . 982
Education in Germany—Technical ... 999
Education in the United States—Engineering 115
Effect of Wind on Roofs 445
Elastic Limit of Metals..... 423
Electrical Engineering. Engineering Index 128, 288, 453, 608, 766, 1010
Electrical Smelting of Copper 282
Electrical Statistics in Germany 993
Electric and Steam Traction 280
Electricity in Manufacturing Plants .. 592
Electric Lighting—Possible Economies in 104
Electric Motors for Pumps 437
Electric Motor—Single-Phase 988
Electrolytic Copper Refining..... 279
Engineering and Chemistry 120
Engineering and Population 274
Engineering—Commerce and 737
Engineering Education in the United States 115
Engineering Index ...123, 283, 447, 603, 761, 1005
Engineering—Mathematics and 266
Engineering Societies—The Localization of 596
Europe—The Grand Central Railway of 261
Exhaust Steam—The Utilization of.. 443
Experiments on Air Resistance 107
Feed Water—The Preparation of Boiler 748
Filtration and Typhoid 754
Fire-Proof Construction 440
Flames—The Temperature of 743
Flight—Recent Experiments in Gliding 272
Flow in Centrifugal Pumps..... 435
Fuel in Power Stations—Economy of . 111
Fuel—Possibilities of Liquid 263
Furnace Gases—Gas Engines for 594
Gas-Engine Design 758
Gas Engines for Furnace Gases 594
Gas Engines in Railroad Work 994
Gas Power for Central Stations.... 741
Gas Works Engineering, Engineering Index.....135, 294, 459, 614, 773, 1017
Generation of Superheated Steam ... 587
German View of American Industry.. 264
Germany—Electrical Statistics in.... 993
Germany—Technical Education in ... 999
Gliding Flight—Recent Experiments in 272
Grand Central Railway of Europe.... 261
Great Britain—The Development of Shipbuilding in 581
Grinding as a Machine-Shop Process . 434
Growth of the Suez Canal 441
Heat—Power Generation from 428
Heat Treatment of Steel.....275, 991
High-Speed Steel—Machine Tools and 1002
High-Speed Tool Steels..... 599

Ice Breakers, Modern..... 1003
Index—The Engineering.....123, 283, 447, 603, 761, 1005
Industrial Economy, Engineering Index.....138, 295, 459, 615, 774, 1017
Industry—The Influence of Science upon 259
Influence of Engineering Education .. 982
Influence of Science upon Industry.. 259
Instruction of Apprentices..... 438
Invention—The Nature of 1001
Invention. *See also* Patent.
Iron and Steel Pipe—Wrought 277
Laboratory—A Swiss Mechanical 600
Lighting—Possible Economies in Electric 104
Liquid Fuel—Possibilities of 263
Localization of Engineering Societies 596
Machine-Shop Process—Grinding as a 434
Machine Tools and High-Speed Steel 1002
Manufacturing Plants—Electricity in. 592
Marine and Naval Engineering, Engineering Index.....139, 296, 460, 616 775, 1019
Marine Engines—Non-Reversible ... 755
Marine Use—Petroleum Motors for . 106
Materials—The Deformation of 590
Mathematics and Engineering 266
Mechanical Engineering, Engineering Index.....141, 297, 461, 618, 777, 1020
Mechanical Laboratory—A Swiss..... 600
Mechanical Road Traction 986
Mechanical Road Vehicles 425
Metals—The Elastic Limit of 423
Metric System in Engineering 430
Mineral Resources of the United States 109
Mining and Metallurgy, Engineering Index.....148, 304, 469, 625, 787, 1027
Mississippi—The Regulation of the... 426
Modern Coking Processes 432
Modern Ice Breakers 1003
Modern Naval Boilers 752
Modern Transatlantic Steamships ... 101
Money Value of Technical Training . 589
Motors for Marine Use—Petroleum .. 106
Motors for Pumps—Electric 437
Nature of Invention 1001
Naval Boilers—Modern 752
New Suspension Bridge at New York 760
Nickel-Steel Alloys—The Theory of.. 102
Non-Reversible Marine Engines 755
Northernmost Railway of the Earth.. 747
Observation—Strobographic Methods of 750
Oil Engines. *See* Petroleum Motors.
Patent-Law Administration 997
Patent. *See also* Invention.
Petroleum Motors for Marine Use ... 106
Pipe—Wrought Iron and Steel 277
Population—Engineering and 274
Portable Applications of Acetylene.... 116
Possibilities of Liquid Fuel..... 263
Possible Economies in Electric Lighting 104
Power Generation from Heat 428
Power Stations—Economy of Fuel in 111
Practical Advantage of Superheating 757
Preparation of Boiler Feed Water.. 748
Production of Radium 981
Pumps—Electric Motors for 437
Pumps—Flow in Centrifugal 435
Radium—Production of 981
Railroad Work—Gas Engines in 994
Rails in Service — Stremmatograph Tests of 113
Railway Construction in Switzerland 996
Railway Engineering, Engineering Index.....152, 309, 473, 630, 791, 1032
Railway Motor—Single-Phase 988
Railway of Europe—The Grand Central 261
Railway of the Earth—The Northernmost 747
Recent Experiments in Gliding Flight 272
Refining—Electrolytic Copper 279
Regulation of the Mississippi 426
Resistance of Road Vehicles to Traction 268
Road Traction—Mechanical 986
Road Vehicles—Mechanical 425
Road Vehicles to Traction—Resistance of 268
Roofs—Effect of Wind on 445
Science upon Industry—The Influence of 259
Screw Propulsion for Warships 739
Sea Water on Alloys—The Action of 270
Shipbuilding in Great Britain—The Development of 581
Single-Phase Railway Motor 988
Smelting of Copper—The Electrical.. 282
Smoke Prevention 745
Societies—The Localization of Engineering 596
Specific Heat of Steam 985
Steamships—Modern Transatlantic .. 101
Steam—Specific Heat of 985
Steam—The Generation of Superheated 587
Steam—The Utilization of Exhaust.. 443
Steam Traction—Electric and 280
Steel—Heat Treatment of.....275, 991
Steel — Machine-Tools and High-Speed 1002
Steel Pipe—Wrought Iron and 277
Steels—High-Speed Tool..... 599
Storage Battery—Edison 585
Street and Electric Railways, Engineering Index 154, 311, 477, 634, 794, 1034
Stremmatograph Tests of Rails in Service 113
Strobographic Methods of Observation 750
Study of Carbon Vapor..... 597
Suez Canal—The Growth of the 441
Superheated Steam—Generation of... 587
Superheating—Practical Advantages of 757
Suspension Bridge at New York—The New 760
Swiss Mechanical Laboratory 600
Switzerland—Railway Construction in 996

Tangential Water Wheel Efficiencies 121
Technical Education in Germany .. 999
Technical Training—The Money Value of 589
Temperature of Flames 743
Tests of Rails in Service—Stremmatograph 113
Theory of Nickel-Steel Alloys 102
Tools and High-Speed Steel—Machine 1002
Tool Steels—High-Speed 599
Traction—Electric and Steam 280
Traction—Mechanical Road 986
Traction—Resistance of Road Vehicles to 268
Transatlantic Steamships—Modern.. 101
Treatment of Steel—The Heat 275
Typhoid—Filtration and 754
United States—Engineering Education in the 115
United States—Mineral Resources of the 109
Utilization of Exhaust Steam..... 443
Utilization of Wastes..... 118
Value of Technical Training—The Money 589
Vapor—A Study of Carbon..... 597
Vehicles—Mechanical Road 425
Vehicles to Traction—Resistance of Road 268
Wages—The Determination of 579
Warships—Screw Propulsion for..... 739
Wastes—The Utilization of..... 118
Water—The Preparation of Boiler Feed 748
Water Wheel Efficiencies—Tangential 121
Wind on Roofs—Effect of 445
Workshop Economics 583
Wrought Iron and Steel Pipe 277